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The accompanying extract giving a short sketch of the history of the lac industry, taken from the Report of the Maritime Trade of Bengal for 1907-08, is published for general information.

By Order,
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Secy. to Govt. Gen & Rev. Depts.

"In view of the increasing importance of the lac industry and the expansion in the last few years of the export trade which is practically a monopoly of Calcutta, a short sketch of the history of the industry may be of interest.

Origin of Lac:—Lac is a resinous incrustation produced by a small scale insect upon the twigs of certain trees, and is found in many parts of the Indian Continent. The lac originates as an excretion which accumulates round and encloses the insect beneath a shell-like covering. As the insects live and feed closely packed together, the excretion coalesces and results in the formation of a continuous incrustation on the twigs. About 15 days before the swarming of the young larvæ, which takes place twice in the year as a rule, the twigs are broken off and collected, and from the article of commerce known as "Stick-lac". To provide for future crops a portion of the "Stick" is set aside, and lightly wrapped in grass, and subsequently bound on to fresh branches of unaffected trees at the suitable time for propogation.

Manufacture of Shellac, Button lac and Garnet-lac:—The Stick-lac is sent to the factories where it is converted into Shellac. It is beyond the scope of this note to describe the process of manufacture at length, but it is briefly as follows:—The Stick-lac is crushed in mills, and the substance obtained is softened and separated into three masses consisting of (i) fragments of twigs which are used as fuel; (ii) fine dust consisting of particles of lac and dirt, technically called *Khud*; this is sold to the makers of bangles and toys; (iii) granular lac, known by the trade name of Seed-lac.

The Seed-lac is soaked in water for about twenty-four hours, the lac cells are broken up and the Seed-lac is reduced to a smaller and uniform granulation. During this process the water becomes of a deep purple claret colour, and forms the substance known as lac-dye. After being washed, the Seed-lac is exposed on drying floors to the light and air, whereby it is thoroughly dried and to some extent bleached. It is then often mixed with orpiment (yellow arsenic) or with resin, or with both. The former makes the lac opaque and imparts to it a pale straw colour; it is used in the making of Shellac, but not of Garnet, Button and other grades in which paleness is not required. The resin serves to lower the melting point and its use in certain quantities is a necessity. But owing to its cheapness it is often used to adulterate Shellac unduly. Two to five per cent is the normal adulteration permissible; but American buyers have complained that the adulteration has in some consignments reached nearly twenty-five per cent.

The Seed-lac, mixed with the powdered orpiment and resin, is put into long narrow cloth bags which are held over open fires and slowly twisted up. The melted lac is squeezed out of the bags upon the floor, and is then stretched into thin sheets. The various qualities of Shellac classified according to purity and shade of colour, are known to the trade as "Fine Orange D.C." "Livery," "Native Leaf," etc. Only the finer qualities of Seed-lac of a pale colour are made into Shellac. More highly coloured lacs are made into thick dark-red sheets known as Garnet-lac. From the residuary matter extracted by boiling from the melting bags two qualities of inferior lac known as Button-lac are obtained and are largely used in the preparation of sealing wax.

Up-to-date European factories equipped with steam appliances employ much the same process as the Native factories, and differ from the latter mainly in point of rapidity and magnitude of production.

The chemical composition of the various lacs is as follows:—

Stick-lac.	*Shellac.*	*Seed-lac.*
Resin 68 per cent	Resin 90·9	Resin 88·5.
Colouring extract 10 per cent	Colouring extract ·5	Colouring extract 2·5.
Wax 6 per cent	Wax 4	Wax 4.
Gluten 5·5 per cent	Nitrogenous matter 2·8	Gluten 2.
Extraneous substances 6·5 per cent		
Loss 4 per cent		

History of Lac.—The industry is one of the most ancient of the minor industries of India, and is said to have an antiquity of several thousand years. The cultivation and collection of lac was, and is still, almost entirely in the hands of the aboriginal races dwelling in the poorer parts of the country, and the methods of propagation and collection have remained unchanged for centuries. These methods satisfied the Indian demand for the article, and until recent years the demand of the export trade also. In fact until comparatively recently there was little foreign demand for lac-resin, as its properties were not fully appreciated. At the beginning of the 19th century the exports of lac-dye were five or six times more valuable than those of the resin. Between 1868 and 1900 the value of the exports of lac-dye fell from

Rs. 4,45,612 to nil, while that of the Shellac exported rose from Rs. 18,41,491 to Rs. 92,65,600. Lac-dye is now a waste product, and it is hoped in future to avoid in whole or in part the troublesome necessity of extracting it by postponing the season of collecting the Stick-lac until after the swarming of the young lac larvæ, to whose presence in the lac cells much of the colouring matter is due. Lac dye has been robbed of its commercial value by the introduction of synthetic dyes.

Sources of supply.—The lac insect is widely distributed throughout the continent of India and Burma, and exists upon some 87 varieties of trees, of which the most important are (*i*) *Schleichera trijuga*, (*ii*) *Butea frondosa*, (*iii*) *Ficus Bengalensis*, (*iv*) *Ficus religiosa*, (*v*) *Ficus Rumphil*, (*vi*) *Cajanus indicus*, (*vii*) *Zizyphus Jujuba*. Numbers (i) and (ii) yield the finest lac and European factories make use solely of their products, which are known as *Nagali* and *Baisakhi* (*or Katki*) respectively. The industry is especially flourishing in the Central Provinces, and in the Native States of Rewa and Nagod in Central India; while in parts of Bengal and in Upper Burma it has attained considerable dimensions. It is carried on upon a small scale in Bombay, the Punjab, the United Provinces and parts of Madras and Mysore. In Rewa a revenue of over 5 lakhs was obtained by the State from the industry in 1905-06.

Uses of Lac.—In India Lac enters very largely into the agricultural, commercial, artistic, manufacturing and domestic operations of the people. In the village it is used either as a varnish or a colour medium in the production of tables, bed posts, chairs, boxes, platters, etc. Silver and copper-smiths, swordsmiths, and carriage manufacturers employ it in their trades. It is used in the painted pottery industry in Bengal, Lucknow and Oudh generally, and in the Punjab, and by jewellers and makers of bangles throughout India. It is extensively used by book-binders and makers of hooka pipes, and for colouring toys and fans; while marbles, pens, sealing-wax, ink-bottles and imitation flowers and fruits are made out of it. Its use in the form of a spirit varnish is spreading in India among manufacturers of certain classes of articles such as carriages and furniture; but in this form it is imported from Europe, India not yet having begun to make spirit varnishes owing to the want of cheap industrial alcohol.

In Europe and America it is widely used as a varnish particularly as a spirit varnish and polish for furniture and metal, as a stiffening material for hats, as an ingredient in lithographic ink and as sealing wax. The increasing utilisation of varnish and lacquer in the manufacture of motors, bedsteads, cycles and gramophone records and as an insulating medium in electrical appliances, has resulted in the demand far exceeding the supply of shellac, with the result that prices have risen rapidly in foreign markets and much of India's commercial lac is exported either in its crude state or at a very early stage in its manufacture.

Prospects of the Industry.—There is every reason to anticipate a great expansion of the industry. The uses of lac are more likely to be extended than to be restricted, and it is threatened by no rival. The artificial substitute, the discovery of which was announced some years ago in Germany, has not been brought into use. There is further immense scope for the development of the sources of supply. The lac insect has had to contend so far with many enemies, chief among which are animals, insects fungi, climatic influences, forest fires and man. Unseasonable heavy rain at the time of the swarming of the young larvæ, frost and hail are extremely harmful; while the rude and primitive methods of collection in vogue among the cultivators, coupled with the over-collection induced by the great demand and high prices now prevailing, are most detrimental to future supplies. Much of the waste is due to preventable causes. The India Forest Department has of recent years devoted considerable attention to the industry, and has initiated experiments towards introducing improved methods of cultivation which have yielded promising results. India virtually enjoys a monopoly of the raw article, Indo-China the only competitor, exporting only an insignificant quantity of an inferior kind.

Factories.—In 1906, the last year for which statistics are available, of factories employing more than 50 persons daily there were 62 in Bengal and the United Provinces employing a total average number of 5,869 persons daily. Thirty-five of these factories, employing an average number of 2,965 persons daily, were in Mirzapur (United Provinces).